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U.S. Department of Transportation
Docket Management System
1200 New Jersey Ave, SE
West Building Ground Floor, Room W12-140
Washington, DC 20590

Re: Petition for Exemption for UAS Weighing 55 Pounds or More

PETITION FOR EXPEDITED GRANT OF EXEMPTION

Dear Sir or Madam:

Pursuant to 49 U.S.C. § 44807 and 14 C.F.R. Part 11, **Joshua H. Wilson** ("**Petitioner**") hereby petitions the Federal Aviation Administration (FAA) for exemption from §§ 61.3(a)(1)(i); 91.7(a); 91.119(c); 91.121; 91.151(b); 91.405(a); 91.407(a)(1); 91.409(a)(1) and (a)(2); 91.417(a) and (b); 137.19(c), (d), (e)(2)(ii), (e)(2)(iii) and (e)(2)(v); 137.31; 137.33; 137.41(c); and 137.42 of Title 14, Code of Federal Regulations (14 CFR), to the extent necessary to allow Petitioner to operate an unmanned aircraft system (UAS) weighing 55 pounds or more within visual line of sight (VLOS) during daytime operations in accordance with the safety measures specified in this Petition. The operations proposed herein involve a single pilot in command (PIC) operating either a single DJI Agras T-16 (the "**T16**") or DJI Agras T-20 for commercial agricultural-related services.

The FAA has previously issued a grant of exemption for commercial agricultural-related services involving a UAS weighing 55 pounds or more in Exemption No. 18009 (the "**Powers Flight Group Exemption**"). Petitioner respectfully requests a grant of exemption relief for this Petition because such grant is in the public interest and the operations proposed in this petition will provide a level of safety at least equal to the existing rules.

I. Description of Petitioner, the UAS, and the Proposed UAS Operations ("**Petitioner**") I am a small family farmer who is looking to start a commercial application business using modern drones. I will be applying agricultural pesticides, fungicides, insecticides and herbicides on crops such as corn, soybeans, milo, and small grains. I have also been approached about doing large area decon for outdoor sporting events and gatherings to help prevent the spread of communicable diseases. Most of the decon spraying would be done on a not for profit situation. I currently own a T16 but may upgrade to the T20 if business permits.

The T16 and T20 both feature a foldable frame, quick-release spray tank, and flight battery, making replacement, installation, and storage easy. The stable and reliable modular aerial

electronics system is integrated with a dedicated industrial flight controller, OCUSYNCTM 2.0 HD transmission system, and RTK module. They have dual IMUs and barometers and adopt a propulsion control system redundancy design including both digital and analog signals to ensure flight safety. The GNSS+RTK dual-redundancy system is compatible with GPS, GLONASS, BeiDou, and Galileo. The T16 and T20 also support centimeter-level positioning when used with the onboard D-RTKTM antennas. Dual-antenna technology provides strong resistance against magnetic interference. The upgraded spraying systems feature an improvement in payload, spray rate, and spray width.

The T16 also has a new generation electromagnetic flow meter, providing high precision and stability, while the T20 offers an upgrade with a 4-channel electromagnetic flow meter to ensure consistent spraying for all sprinklers. The T16s digital beam forming (DBF) imaging radar features obstacle sensing and terrain following capabilities during both day and night, without being affected by light or dust. The T20's new-generation omnidirectional digital radar provides functions such as terrain following and obstacle sensing and circumventing in all horizontal directions. Both the T16 and the T20 can plan a flight path to actively circumvent obstacles and are equipped with a wide-angle FPV camera enabling observation of the landscape from the front of the aircraft.

The T16 and T20 are dustproof, waterproof, and corrosion-resistant. The T16 has a protection rating of IP54 (IEC standard 60529), and the T20 has a protection rating of IPX6 (IEC standard 60529), while the protection rating of the aerial-electronics system, spray control system, and propulsion ESC system for both UAS is up to IP67.

The remote controller of both the T16 and the T20 uses the DJI OcuSync 2.0 dual-band transmission system, with a maximum control distance of up to 5 km (3.11 mi) for the T16 and 3 km for the T20 also supporting Wi-Fi and Bluetooth functions. The remote controller is equipped with a 5.5-inch bright, dedicated screen that has the DJI Agras app built in. For the T20, when the RTK dongle is connected to the remote controller, users can plan operations to centimeter-level precision. Both the built-in battery and external battery can be used to supply power to the remote controller. The total working time is up to 4 hours.

Given the description and performance specifications of the T16 and T20, Petitioner has identified the following risks and mitigation measures:

1. UAS Risks and Petitioner's Mitigation Measures

Risk 1: UAS Lost Signal, UAS Low Battery, UAS Lost Visual Line of Sight.

Mitigation: The DJI Agras use upgraded radar systems to increase flight safety by employing Digital Beam Forming (DBF) technology which allows for 3D point cloud imaging that fully senses the surrounding environment and aids in circumventing obstacles. When used with the Intelligent Operation Planning System and the DJI Agriculture Management Platform, a user can plan operations, manage flights in real-time, and closely monitor aircraft operating status. With a fault-tolerant control system, a hexacopter or octocopter can land safely even in the event of propulsion system failure.

Mitigation: The DJI Agras have on-board safety features that ensure they can operate safely under both normal and contingency operating conditions. These features include automation to increase safety and reduce pilot workload. Some examples are the Return to Home (RTH) feature that will navigate the DJI Agras to a certain RTH altitude, then transport the DJI Agras to the location of takeoff, unless overridden with a new home location. RTH activates in the case of lost signal, low battery, and RTH can be activated by the pilot for reasons such as loss of visual line of sight or loss of control. The DJI Agras incorporates fly away prevention measures via mission planning software that permits creation of geofencing areas that prohibit flight paths over unwanted terrain.

Mitigation: The PIC will be trained in accordance with Petitioner's training program. The program will include: maintaining VLOS of the DJI Agras unaided by any device other than corrective lenses, scanning the airspace where the DJI Agras is operating for any potential collision hazards, and maintaining position awareness of the UAS through direct visual observation. The aircraft will be operated within VLOS of the PIC at all times. If the PIC is unable to maintain VLOS during flight, then the flight operation will be terminated as soon as practicable.

Risk 2: Flight over unwanted area.

Mitigation: The DJI Agras flight controller and DJI assistant software permit Petitioner to create geofenced areas that prohibit flight paths over unwanted terrain. Moreover, Petitioner will restrict operation of the DJI Agras to VLOS and also reserve manual controls to avoid flight over unwanted areas as needed.

Risk 3: UAS Flyaway

Mitigation: Flyaways can occur for a variety of reasons, most commonly UAS misconfiguration (compass), lack of following pre-flight checklist (setting RTH location/home), or operator error. Petitioner mitigates this risk through the ability to take control of the DJI Agras at any time using the radio controller as described above. Furthermore, the relatively limited flight time of the DJI Agras mitigates the risk of flyaway to areas of higher population.

Mitigation: All operations will be conducted under safe conditions and during times of day when the area of operations is clear of all persons unrelated to the operations. Operations shall be conducted from and over predetermined, uninhabited, segregated, and controlled-access gathering areas and the PIC will ensure the entire operational area will be controlled to eliminate or minimize any risk to persons and property on the ground, as well as other users of the UAS. This area of operation will include a defined lateral and vertical area where the aircraft will operate and will be geofenced to prevent any lateral and vertical excursions by the operating aircraft. Safety procedures will be established for persons, property and applicable airspace within the area of operation. A briefing will be conducted regarding the planned DJI Agras operations prior to any operations conducted at each area. All personnel who will be performing duties within the boundaries of each area of operation will be present for this briefing before commencing operations. Additionally, all

operations conducted under this exemption will occur only in areas of operation that have been physically examined by Petitioner prior to conducting the operations, and in accordance with the associated COA.

Mitigation: Petitioner has a redundant failsafe in place that takes over in case of a flyaway. For example, two points are programmed into the software controlling the aircraft, and these points create a geographic fence for the flight computer. The DJI Agras will maintain limits within the determined area. If the DJI Agras falls outside of the area it will stop and hover in the location breached, allowing the PIC to take manual control.

Risk 4: Inclement Weather

Mitigation: The DJI Agras has water tight seals that protect the aircraft internals from weather. This provides some protection and allows the PIC to fly the DJI Agras under light rain. In the event of a quick downpour, this housing allows the operator to return the aircraft home, or quickly land it, before systems begin to fail. Before every flight Petitioner's pilots check the weather to ensure favorable weather conditions. If weather is IMC or below VFR standards flights will not be conducted.

Risk 5: Software error causes operational issue.

Mitigation: The navigational and flight control equipment are OEM components from DJI, a large equipment manufacturer selected for being common, well-supported, and safe due to testing by the manufacturers and iterative improvements caused by users in the field reporting errors (as opposed to being purchased from companies that are selling prototype and initial-run units prone to manufacturing and engineering problems).

Risk 6: Malfunction of spraying equipment (nozzles, pumps, tubing) causes spray of target that should not be sprayed.

Mitigation: TeeJet spray nozzles are a common or standard nozzle for agricultural spraying operations. The T16 and the T20 both use 8 off-centered, flat-fan-pattern nozzles (Model# XR11001VS) that produce a straight thirteen-foot wide swath when sprayed from 5 feet above a target. The quick-change nozzle set-up allows the operator to swap nozzles if the chemical mix, target composition or environmental conditions dictate.

Risk 7: Failure of mission planner software.

Mitigation: Petitioner's PIC is able to manually take control of the DJI Agras at any given time. Petitioner utilizes a radio controller manufactured by DJI that is an industry standard model and includes a toggle switch to transition from programmed to manual flight control. This permits the PIC to observe the T16 and the T20 in flight and take over for any reason.

II. A Grant of Exemption is in the Public Interest

A Grant of Exemption for this Petition is in the public interest for the following reasons:

A. Agricultural farming is a vital commodity for economic prosperity in Virginia. However, drift and runoff of pesticides from overuse presents an environmental risk to the public that threatens public watersheds. Use of the DJI Agras will allow Petitioner to apply pesticide treatments to specific areas that need it most, which will minimize the risk of chemical drift and runoff, protecting public watersheds, and increasing the health and quality of the Petitioner's crops. In addition, Petitioner plans to apply seed applications with the DJI Agras to areas prone to water collection which will minimize water saturation and mitigate the risk of soil erosion. Therefore, granting this Petition is in the public interest.

B. Petitioner's proposed primary operations are to use the DJI Agras applications for airborne commercial agricultural-related services as described in 14 C.F.R. Part 137, which services would otherwise be achieved by a manned aircraft. A manned aircraft providing agricultural-related services presents a risk of fatality to the crew and any passengers onboard. The use of the DJI Agras, rather than a manned aircraft, completely mitigates this fatality risk to the crew and any passengers because the DJI Agras is remotely operated. Therefore, granting this Petition is in the public interest.

C. Unlike most aircraft used for agricultural applications, the DJI Agras has multiple rotors; in the case of failure, a multirotor DJI Agras has software to detect a malfunction and correct itself with the compensatory use of the remaining motors. In contrast, a malfunction of a rotor in a manned aircraft could result in engine failure and loss of life and aircraft. Therefore, granting this Petition is in the public interest.

D. A manned aircraft providing agricultural-related services produces significant levels of environmental and noise pollution when compared to the DJI Agras. The DJI Agras is powered by battery, rather than by fuel, which completely mitigates the environmental and noise pollution effects produced by flammable 100LL or Jet A fuel. The T16 and the T20 will result in substantially less environmental and noise pollution to the public when compared to a manned aircraft. Therefore, granting this Petition is in the public interest.

E. The DJI Agras is powered by batteries which are not as flammable or as explosive as 100LL or Jet A fuel. In the event of a UAS crash, the risk of personal injury resulting from post-crash fire or explosion is mitigated. In contrast to the large props on helicopters, the small props on a UAS would cause significantly less property damage in a post-crash sequence. Therefore, granting this Petition is in the public interest.

F. A manned aircraft providing agricultural-related services conducts spray operations at higher altitudes and at higher rates of speed, increasing the probability of drift resulting from the application of economic poisons, as well as increasing the probability of collision. The DJI Agras will conduct its spray operations around 20 feet above ground level, and at a maximum speed of 5

mph. Use of the DJI Agras will substantially reduce the likelihood of mid-air collision and drift of economic poisons when compared to a manned aircraft. Therefore, granting this Petition is in the public interest.

III. A Grant of Exemption Will Provide a Level of Safety at Least Equal to the Existing Rules.

Listed below are the specific FARs from which an exemption is sought, the rationale for why an exemption is needed, and a brief summary of the operating procedures and safeguards, that will ensure that the proposed operations will be conducted at a level of safety that is at least equal to that provided by the rule from which exemption is sought. For ease of review, this section divides the applicable FARs into three main categories: FARs pertaining to (A) the UAS; (B) UAS Operating Parameters; (C) Part 137 Certification Requirements; and (D) Pilot Certification.

2. FARs Pertaining to the UAS

§ 91.405(a), *Maintenance required*
§ 91.407(a)(1), *Operation after maintenance, preventive maintenance, rebuilding, or alteration*
§ 91.409(a)(1) and (2), *Inspections*
§ 91.417(a) and (b), *Maintenance records*

Petitioner seeks an exemption from the following maintenance-related FARs of Part 91. An exemption from these FARs is necessary because the provisions are either not compatible with or are unnecessary in the context of the proposed UAS operations.

Petitioner seeks an exemption from the following maintenance and inspection-related FARs: §§ 91.405(a) Maintenance required, 91.407(a)(1) Operation after maintenance, preventive maintenance, rebuilding, or alteration, 91.409(a)(1) and (2) Inspections, and 91.417(a) and (b) Maintenance records. These regulations specify maintenance, inspection, and records standards in reference to FAR § 43.6. An exemption from these regulations is needed because Part 43 and these sections apply only to aircraft with an airworthiness certificate, which the UAS to be operated under this exemption will not have, and because compliance with these regulatory provisions in the context of UAS operations is not feasible.

An equivalent level of safety will be achieved because maintenance, inspections, and records handling will be performed in accordance with the manufacturer's user manual and any required manufacturer safety or service bulletins, and if this Petition is granted, any conditioning limitations. For example, the manufacturer's user manual and the Petitioner's own standard operating procedures require the PIC to conduct a pre-flight inspection of the UAS and all associated equipment to account for all discrepancies and/or inoperable components. Maintenance will be performed and verified to address any conditions potentially affecting the safe operation of the UAS, and no flights will occur unless and until all flight critical components of the UAS have been found to be airworthy and in a condition for safe operation.

A functional test flight will also be conducted in a controlled environment following the replacement of any flight critical components, and, as required by the user manual, the PIC who conducts the functional test flight will make an entry in the UAS aircraft records of the flight. Functional flight tests will not involve the carriage of hazardous materials, and the operator will be required to follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the UAS and its components. Along with the preflight checklists, Petitioner's own standard operating procedures, and a routine maintenance program, Petitioner believes an equivalent level of safety is met, and that equipment at risk of failure can be safely identified before flights occur.

In the Powers Flight Group Exemption, the FAA determined that the proposed UAS operations required exemption from FAR §§ 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), on the fact that "petitioner had a documented history of active quality control including identification and correction of procedural deviations and mechanical anomalies, including necessary design changes, to improve system reliability" and that the achievement of an adequate level of safety required certain conditions and limitations. Petitioner has proposed in this Petition a number of limitations related to maintenance, inspections, and records which it believes provide a level of safety at least equivalent to that provided by FAR §§ 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b). For this reason, and consistent with the Powers Flight Group Exemption, Petitioner requests an exemption from these sections without having to perform the inspections and maintenance items required by FAR §§ 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b).

3. FARs pertaining to UAS Operating Parameters

§ 91.7(a), *Civil aircraft airworthiness*
§ 91.119(c), *Minimum safe altitudes*
§ 91.121, *Altimeter settings*
§ 91.151(b), *Fuel requirements for flight in VFR conditions*

Petitioner seeks an exemption from the following operating parameter-related FARs in Part 91. An exemption from these FARs is necessary because the provisions are either not compatible with or are unnecessary in the context of the proposed UAS operations.

Inasmuch as there will be no airworthiness certificate issued for the UAS, Petitioner seeks an exemption from § 91.7(a) *Civil aircraft airworthiness*, which requires that a civil aircraft be in an airworthy condition to be operated. While the UAS operated by Petitioner will not have an airworthiness certificate, consistent with the FAA's determination in the Powers Flight Group Exemption, the PIC may determine the UAS is in an airworthy condition prior to flight. As described more fully in the operating documents, this is achieved through adherence to Petitioner's routine pre-flight checklist, regularly scheduled maintenance, and the enhanced pilot training requirements of Petitioner's Pilot Training Program.

Petitioner also seeks an exemption from FAR § 91.119(c), *Minimum safe altitudes*, to the extent necessary to allow UAS operations over other than congested areas at altitudes lower than those permitted by rule. The ability to operate at those altitudes is one of the key benefits of using UAS for the proposed activities. An equivalent or greater level of safety will be achieved given the size, relatively light weight, and slow speed of the UAS, as well as the controlled location where the operations will occur.

As described in herein, Petitioner will maintain an average operating altitude of 20 feet AGL during spray operations and a maximum altitude of 200 feet AGL which is significantly lower than the 500 feet limit set in the Powers Flight Group Exemption. Furthermore, Petitioner's operating parameters will be limited to public gathering areas during periods of closure to the public and other non-essential personnel.

Petitioner will ensure all paperwork at the state and local level will be filed before and after operations. Petitioner will comply with all state laws regarding the application of economic poisons, including agency notification, mapping, and specified safety procedures. In the controlled environment where Petitioner operations will occur, flying at a low altitude increases the aircraft's efficiency, without posing any increased risk to person or property. Even at these low altitudes, Petitioner's UAS operations will be conducted at a level of safety equal to or greater than that achieved by other large unmanned aircraft performing similar activities at the altitudes required by § 91.119.

Petitioner also requests an exemption from § 91.121, *Altimeter settings*, which requires a person operating an aircraft to maintain cruising altitude or flight level by reference to an altimeter that is set to the elevation of the departure airport or barometric pressure. In the Powers Flight Group Exemption, the FAA deemed an equivalent level of safety to the requirements of § 91.121 can be achieved in circumstances where the PIC uses an alternative means for measuring and reporting UAS altitude, such as global positioning system (GPS). The DJI Agras will be equipped with GPS or other equipment for measuring and reporting UAS altitude, and the PIC will check the UAS altitude reading prior to each takeoff, effectively zeroing the UAS's altitude at that point. Consistent with previously granted exemptions, these requirements ensure that an equivalent level of safety will be achieved, and an exemption from the requirements of § 91.121 is therefore appropriate.

Finally, Petitioner seeks an exemption from FAR § 91.151(b), *Fuel requirements for flight in VFR conditions*, which would otherwise require a 20-minute fuel reserve to be maintained. In the Powers Flight Group Exemption, the FAA determined that a requirement prohibiting the PIC from beginning a UAS flight unless (considering wind and forecast weather conditions) there was enough available power for UAS to operate for the intended operational time and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater would ensure an equivalent level of safety to the fuel requirements of § 91.151. Petitioner will adhere to the same reserve power requirement and an exemption from § 91.151's fuel requirements for flight in VFR conditions is therefore appropriate.

4. FARs pertaining to Part 137 Certification Requirements

§ 137.19(c), (d) and (e)(2)(ii)(iii) and (v) *Certification requirements*
§ 137.31, *Aircraft requirements*
§ 137.33, *Carrying of certificate*
§ 137.41(c), *Personnel*
§ 137.42, *Fastening of safety belts and shoulder harnesses*

Petitioner seeks an exemption from the following FARs in Part 137. An exemption from these FARs is necessary because the provisions are either not compatible with or are unnecessary in the context of the proposed UAS operations.

In the Powers Flight Group Exemption, the FAA determined that relief from § 137.19(c) was necessary to permit persons holding a remote pilot certificate to act as pilot in command for agricultural aircraft operations under the exemption. Petitioner will comply with all knowledge and applicable skill requirements in part 137 as well as Petitioner's training requirements in the operating documents. The FAA also determined, in the Powers Flight Group Exemption, that a commercial or airline transport certificate that § 137.19(c) requires was not a reasonable requirement when the proposed operations would not adversely affect safety. The basis for the relief was that Powers Flight Group's remote PICs would comply not only with the requirements of Part 107, subpart C, but also with the additional knowledge and applicable skill requirements in § 137.19(e)(1) and (2)(i), (iv) and (vi). The relief was also based, in part, on Powers Flight Group's compliance with the training requirements in its operating documents.

The operations proposed by Petitioner herein are similar to that previously approved by the FAA in the Powers Flight Exemption. Consistent with the FAA's prior analysis in the Powers Flight Group Exemption, Petitioner will achieve a level of safety at least equal to the existing rules through compliance with the requirements of Part 107, subpart C, the additional knowledge and applicable skill requirements in § 137.19(e)(1) and (2)(i), (iv) and (vi), and compliance with the training and risk mitigation measures in Petitioner's operating documents.

Consistent with the FAA's prior analysis of §§ 137.19(d) and 137.31 in the Powers Flight Group Exemption, Petitioner will be capable of ensuring that the UAS are in a condition for safe operation based upon a thorough pre-flight inspection and compliance with the operating documents. The DJI Agras has a proven operational history and contain design safety features such that operations conducted under the requirements of this exemption will not adversely impact safety.

Petitioner seeks an exemption from the knowledge and skill test requirements in § 137.19(e)(2)(ii), (iii), and (v), *Certification requirements*, because those requirements are not compatible or applicable to Petitioner's proposed UAS operations. Consistent with the FAA's prior analysis in the Powers Flight Group Exemption, Petitioner's training and certification program described in the operating documents provides the remote PIC with the necessary skills to safely operate the UAS. For this reason, granting relief from a demonstration of the skills described in § 137.19(e)(2)(ii), (iii), and (v) will not adversely impact safety, and therefore relief is warranted. Petitioner's pilots operating UAS under the exemption will still be required to demonstrate the skills listed at § 137.19(e)(2) as applicable, in accordance with the provisions of § 137.19(e), which requires such demonstration in order to obtain the agricultural aircraft operator certificate, unless

otherwise exempted. Also, consistent with the FAA's finding in the Powers Flight Group Exemption that relief from the associated knowledge and skill test requirements of § 137.41(c) is also warranted because of the relief provided to § 137.19(e)(2)(ii), (iii), and (v), Petitioner seeks an exemption from the interrelated knowledge and skill test requirements of § 137.41(c), *Personnel*.

Petitioner seeks an exemption from § 137.31(b) *Aircraft requirements* and § 137.42 *Fastening of safety belts and shoulder harnesses*, which relate to the installation and use of a shoulder harness and safety belt on an aircraft. An exemption from these requirements is warranted because Petitioner's UAS do not have an onboard pilot and these regulations are intended to ensure the safety of the onboard pilot during manned agricultural aircraft operations. For this reason, granting the requested relief from §§ 137.31(b) and 137.42 will not adversely impact safety.

Petitioner requests relief from § 137.33(a) *Carrying of certificate*, which requires that a facsimile of the agricultural aircraft operator certificate be carried on the aircraft. The FAA has previously determined that relief from §§ 91.9(b)(2) and 91.203(a) and (b) for the carriage of the aircraft flight manual and aircraft registration onboard the aircraft is not necessary. Consistent with the FAA's prior analysis in the Powers Flight Group Exemption, an exemption is warranted here provided that a facsimile of any aircraft operator certificate and all certificates of registration are kept in a location accessible to the remote PIC. Finally, given that Petitioner's UAS will not have an airworthiness certificate, relief from § 137.33(b) *Carrying of certificate*, which requires the airworthiness certificate (if not carried in the aircraft) be kept available for inspection at the base of dispensing operation is conducted, is necessary. Petitioner will keep registration certificates available for inspection.

Petitioner has attempted to identify the appropriate FARs from which an exemption is needed in order to conduct the proposed operations in this Petition for Exemption. To the extent that the FAA determines that Petitioner needs an exemption from other FARs which are not addressed or explicitly named in order to conduct the proposed operations, Petitioner also seeks an exemption from those FARs for the reasons outlined above.

5. FARs Pertaining to Pilot Certification

§ 61.3(a)(1)(i), *Requirement for certificates, ratings, and authorizations*

Petitioner will conduct the proposed operations under 14 CFR Part 91, rather than under part 107. In general, Part 91 is predicated on the presumption that the pilot in command conducting an operation under Part 91 holds an airman certificate under Part 61. As a result, the FAA has determined granting exemption from the requirement of § 61.3(a)(1)(i) to require a person holding a remote pilot in command certificate (with the appropriate training and demonstration of knowledge and skills required by this exemption) to conduct the operations to which this exemption applies will ensure clarity.

The statutory obligation for an airman certificate is codified at 49 U.S.C. § 44711(a)(2). Pilots who conduct operations under this exemption with a remote pilot in command certificate would comply with § 44711(a)(2), as the FAA described in the Operation and Certification of Small Unmanned Aircraft Systems final rule (81 FR 42064, 42088-89 (June 28, 2016). The general

requirements for all airmen include: eligibility, aeronautical knowledge and Transportation Security Administration (TSA) vetting. Given that the operation would occur only after airmen who hold a current remote pilot in command certificate have received specific training, have visited the area of operation and are fully capable of using the tools available to prepare for the operation, conduct comprehensive preflight actions, and conduct the operation only in a limited geographical area, the FAA has previously determined that a remote pilot certificate issued under 14 CFR Part 107 provides the FAA sufficient assurance of the pilots' qualifications and abilities to perform the duties related to the operations authorized under this Petition. The remote pilot in command certificate confirms Petitioner's eligibility, secures TSA vetting, and ensures the PIC has the requisite aeronautical knowledge for operating the UAS within the NAS.

Remote pilots conducting operations under Part 107 must complete a detailed aeronautical knowledge test, unless they already hold a certificate under 14 CFR part 61, and meet the flight review requirements specified in § 61.56.9. As a result, all such pilots will have the requisite aeronautical knowledge that is a key component of safe completion of all operations that will occur under this exemption. In this regard, the FAA addressed the applicable parts of § 61.125, *Aeronautical knowledge*, in the remote pilot in command certificate requirements.

For the reasons discussed below, this same rationale espoused by the FAA in previous approved exemptions, combined with Petitioner's proposed safety mitigations, also supports a finding that the proposed operations under the requested exemptions can be conducted without adversely affecting safety.

While it is generally true that operations involving UAS weighing 55 pounds or more could raise additional safety concerns when compared operations involving small UAS, the unique nature of the proposed operations, including the low-risk, controlled access of areas during any operations, will ensure that safety remains at least equal to the existing rules. While Part 107 will not apply to the proposed operations, wherever possible, Petitioner intends to conduct the proposed operations in accordance with Part 107.

Petitioner will be able to achieve a level of safety at least equal to that which would be obtained using a PIC holding a manned pilot certificate under Part 61 because Petitioner has instituted an enhanced training program that provides aeronautical knowledge, experience, and flight proficiency tailored to UAS operations, including PIC compliance with Part 107, the applicable sections of Part 137, the risk analysis described in Section I(A) above, and continued periodic training after certification.

The following chart addresses each aeronautical knowledge requirement of § 61.125 and explains whether it is relevant to, different from, or addressed by Part 107 operations or Petitioner internal procedures:

§ 61.125 Aeronautical Knowledge	**Petitioner's Operations**

1. Applicable Federal Aviation Regulations of this chapter that relate to commercial pilot privileges, limitations, and flight operations	Addressed by Part 107.
2. Accident Reporting	Addressed by Part 107.
3. Basic aerodynamics and the principles of flight	Topics applicable to unmanned aircraft are included in Part 107.
4. Meteorology	Applicable meteorology principles are covered by Part 107.
5. Safe and Efficient Operation of Aircraft	Covered by Part 107 and included in Petitioner's training program.
6. Weight and Balance	"Loading and Performance" is addressed by Part 107. Petitioner will comply with the weight limitations of Part 107 and will ensure that external loads do not negatively impact flight characteristics, as required by Part 107.
7. Performance Charts	Not applicable.
8. Effects of exceeding aircraft performance limitations	Not applicable. Topics applicable to unmanned aircraft are included in Part 107.
9. Pilotage and dead reckoning	Not applicable.
10. Use of air navigation facilities	Topics applicable to unmanned aircraft are included in Part 107.
11. Decision making and judgment	Covered by Part 107.
12. Principles and functions aircraft systems	Covered by Part 107 and by Petitioner's internal procedures and use of operations manuals.
13. Emergency operations	Covered by Part 107.
14. Night and high altitude	Not applicable.

15. Operating within the national airspace 16. system	Covered by Part 107.
17. Lighter than air ratings.	Not Applicable.

In the Powers Flight Group Exemption, the FAA determined that an adequate level of safety at least equal to § 61.127, *Flight proficiency*, could be achieved for a UAS that is able to demonstrate preflight preparation; preflight procedures; airport and heliport operations; hovering maneuvers; takeoffs, landings, and go-arounds; performance maneuvers; navigation; emergency operations; special operations; and post-flight procedures. Petitioner has demonstrated proficiency for small UAS under Part 107 licensing, and has incorporated these standards into its PIC training program for the DJI Agras. Thus, Petitioner is able to achieve a level of safety similar or exceeding the existing rules and the Powers Flight Group Exemption.

In the Powers Flight Group Exemption, the FAA determined that, because UAS are far less complicated than manned aircraft, Powers Flight Group could achieve an adequate level of safety at least equal to § 61.129, *Aeronautical experience*, by requiring 20 hours of total flight time of a multi-rotor system as the PIC with at least 10 take-off and landings. Petitioner's training program sets this requirement as a minimum standard, and therefore, Petitioner is able to achieve a level of safety at least equal to the existing rules.

IV. Federal Register Summary

Joshua H. Wilson seeks an exemption from the following rules in Title 14 of the Code of Federal Regulations:

61.3(a)(1)(i); 91.7(a); 91.119(c); 91.121; 91.151(b); 91.405(a); 91.407(a)(1); 91.409(a)(1) and (a)(2); 91.417(a) and (b); 137.19(c), (d), (e)(2)(ii), (e)(2)(iii) and (e)(2)(v); 137.31; 137.33; 137.41(c); and 137.42

Joshua H. Wilson requests an exemption for the purpose of operating Unmanned Aircraft Systems (UAS) weighing 55 pounds or more for agricultural-related services. The relief requested is similar to that granted in Exemption No. 18009 to Powers Flight Group.

V. Conclusion

Petitioner hereby requests exemptions from the regulatory provisions listed above. As set forth in detail above, such exemptions are in the public interest, and granting the exemptions will not adversely affect safety because the exemption will provide a level of safety at least equal to the existing rules. Petitioner may be contacted at:

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Respectfully Submitted,

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Joshua H. Wilson, Owner